

REMARKS

The Examiner is thanked for the thorough examination of the present application. The Office Action, however, tentatively rejected all claims 1-16. Claims 1, 6, 11 and 13 have amended herein to more clearly identify a novel and non-obvious aspect of the present invention. Support for these amendments can be found on the specification of the present invention. Accordingly, no new matter has been added. In view of the foregoing amendments and remarks, it is requested that the rejections of the record be reconsidered and withdrawn.

The Office Action rejected claims 1-16 under 35 U.S.C. § 112, second paragraph, as allegedly incomplete for omitting essential cooperative relationships of elements. Specifically, the Office Action stated that it was not clear, with respect to claims 1, 6, and 13, what the relationships are between "placement direction of the head section and the tail section". Applicants submit that this rejection is rendered moot by the amendments to claims 1, 6, and 13.

Response to 102 rejections

Claims 1, 2, 5-7 and 11-13 were rejected under 35 USC 102 as allegedly anticipated by Ali et al. (U.S. Patent No. 6,836,026). For at least the following reasons, Applicants disagree.

As recited in claims 1, 6, and 13, each I/O circuit comprises a tail section transferring signals to and from external devices and a head section severing as an interface circuit between the tail section and a core circuit region to convert signal level. Specifically, as amended, these claims recite:

1. An I/O circuit placement method for placing I/O circuits included in a semiconductor device, comprising a step of:

placing at least two rows of I/O circuits on a first side of a chip, wherein each I/O circuit has a head section and a tail section, the head section and the tail section are arranged in a column direction perpendicular to a row direction of the I/O circuits, *the tail section transfer signals to and from external devices and the head section severs as an interface circuit between the tail section and a core circuit region to convert signal level.*

6. A semiconductor device, comprising:
a chip; and

at least two rows of I/O circuits placed on a first side of the chip, wherein each I/O circuit has a head section and a tail section, the head section and the tail section are arranged in a column direction perpendicular to a row direction of the I/O circuits, *the tail section transfer signals to and from external devices and the head section severs as an interface circuit between the tail section and a core circuit region to convert signal level.*

13. A semiconductor device, comprising:
a chip;

a core circuit region disposed on the chip;

a loop of I/O circuits disposed at the periphery of the chip and around the core circuit region; and

at least one row of I/O circuits disposed between the loop of I/O circuits, wherein each I/O circuit has a head section and a tail section.

(Emphasis added.) Independent claims 1, 6, and 13 patently define over the cited art for at least the reason that the cited art fails to disclose the feature emphasized above.

As Ali does not teach that tail section transfers signals to and from external devices and a head section severs as an interface circuit between the tail section and a core circuit region to convert signal level, as expressly recited in the claims 1, 6 and 13, Ali does not disclose all features of the invention. For at least these reasons, independent claims 1, 6, and 13 patently define over Ali. Insofar as claims 2-5, 7-12 and 14-6 depend from claims 1, 6 and 13, these claims patently define over Ali as well.

Responses to 103 rejections

Claims 3, 4, 8-10 and 14-16 are rejected under 35 USC 103 as being unpatentable over Ali et al. (U.S. Patent No. 6,836,026).

To properly establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teaching. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2142.

As recited in claims 3, 4, 8-10 and 14-16, the head sections can be oriented to the tail sections or the head sections in the adjacent rows, or the tail sections can be oriented to the tail sections in the adjacent rows.

The Office Action alleges that I/O cells might be oriented in any direction using the technique of designing I/O limited IC (citing col. 2, lines 53-54) without die area waste (citing col. 4, lines 33-38), since the direction of the I/O cells depends on its dimensions (length and height)(citing col. 6, lines 9-11 and 15-23).

However, as cited in col. 6, lines 9-11 and 15-23, Ali only teaches modifying the length and height of each I/O cell for I/O limited designs or core limited designs, rather than placing the tail sections to orient to tail sections or the head sections in the adjacent rows.

Thus, Ali does not teach the head sections can be oriented to the tail sections or the head sections in the adjacent rows, or the tail sections can be oriented to the tail sections in the adjacent rows, as expressly cited in claims 3, 4, 8-10 and 14-16.

Under MPEP 2143, to establish a prima facie case of obviousness, the prior art reference (or reference when combined) must teach or suggest all the claim limitations. Since the cited references do not teach the above-quoted limitations of claims 3, 4, 8-10 and 14-16, the applicant respectfully submit that claims 3, 4, 8-10 and 14-16 should be allowed.

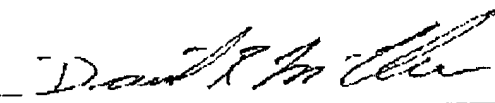
CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

By: _____



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